TOP TEACHER TIPS for *DNA Ahead Game & More™* (Game)

Educational Features of the Game

The Game Board provides a unique picture map of major DNA science discoveries and their uses in biotechnology up through mid-2016—what a brain-full! Playing the game is fun and provides a tour of that landscape while also introducing the Show-&-Tell Cards*, where the real learning and creativity occur apart from game play.*

Show-&-Tell (S&T) Cards prompt critical thinking about the Game's science content and draw upon a variety of talents, especially those of students more inclined toward the arts than the sciences. *The goal is for all students to experience how science ideas can inspire expressions of their unique creativity, in accord with the Game's strong commitment to Full STEAM* Ahead!*

* STEAM, as used here = acronym for Science, Technology, Engineering, Arts, Mathematics

WOW (Whoops-Or-Whoopee) Cards and iii (Issues-Insight-Innovations) Cards have educational uses too, as elaborated in the sections about them following those for the S&T Cards below.

Teaching How To Play the Game

The Quick Start Card and Super Quick Start Sheet distributed with the Game plus a How To Play Video (at http://www.dnaahead.com/dna-game-and-more/) communicate how to play the game, but players need to spend some time with the Game itself to test how easy it is to play.

Select a small team of articulate, board-game-savvy students to play the game, then teach it to other students by playing it with them. Having students "take on the teaching role" is highly desirable and right in line with the major emphasis of ALL the Show-&-Tell Cards. See *S&T 03: Mind Power Leap Card*.

Claim Board Spaces As Mastery Badges

During regular game play, players claim Board Spaces and draw their associated Claim Cards in order to amass Votes to win the title of DNA MVP. But, *apart from game play,* such claims serve as Mastery Badges awarded to individual students or teams for creating products or performances as suggested on Show-&-Tell Cards. Place easily removable stickers on the Game Board (or on a printed copy) to reward such student accomplishments.

Which Spaces are targeted is determined by you, your students, or specific instructions for competitions. Also, since both S&T Cards and the Landmark (LM) Cards whose content they draw upon carry Votes, competitions based on a series of S&T Cards award wins to competitors who achieve the highest Vote Total from S&T Cards + LM Cards those competitors used in their S&T activities. Audiences consisting of teachers, students, and/or community members judge the competitions, whenever feasible.

Show-&-Tell Creativity Cards

S&T 01: Creativity Kindlers Ahead—Overview of the S&T Cards

S&T Cards suggest a specific activity or mini-game to be played using the Game materials; or they suggest a general direction, leaving the creative path to the user. The activities are designed to elicit critical thinking and creative expressions inspired by Claim Card content. Below are tips for using S&T and other Game Cards to introduce such activities. You may want to think up other activities suitable for your teaching situation.

S&T 02: DNA Ahead Picture Trail—The Hands-On-Picture Science (HOPS) Approach

By viewing the pictures on Landmark (LM) Cards before reading the text, students first seek clues to interpret the pictures' intended meanings; then, after studying the text, they critique the picture-idea matches and perhaps suggest ideas for alternative pictures or text. The students' mindset of critic, or even potential art or text upgrader, puts them in the teaching role. I suggest this as an initial approach to all Landmark Cards. Implementations of ideas for alternative pictures or text are, of course, additional projects, *the results of which I hope you will share by sending them to DNAahead@comcast.net.* Even if you don't use the HOPS approach as a separate (S&T 02) activity, introducing it early—and reminding students of it as they pursue other S&T activities—helps to keep their detective and critic mindsets active.

S&T 08: DNA Tourist Attractions
This is a good choice for an early activity. In order to choose what topic(s) to promote, each student or team will need to at least scan a range of Card content; and a group discussion of what factors to consider in making their choice(s) also helps to focus attention on the interests of the targeted audience.

We need more good science communicators who tailor their presentations to connect with their audiences; they are increasingly important to scientific progress, perhaps as important as scientists themselves!

S&T 04: DNA Jolly Jingles
Lines of jingles featuring DNA are placed on a series of small road signs, à la the Burma Shave signs of yore; see banner at top of www.DNAahead.com pages and slide show on Orders Page of that website.

This activity can be adapted to several kinds of competitions. For example, individuals or teams of students in one or more schools can compete to have their jingles placed on signs around their school grounds, neighborhood, or town. Viewers can vote for their favorite jingles, and writers of winning jingles receive prizes. Or, when signs can be placed over a relatively large diverse area, the competition goal can be to find and view the most sign sets, and competitors must write down each jingle to get credit for sign sets. Or, the competitor who installs the most sign sets wins. Scheduling such events for April 25th, National DNA Day, is especially appropriate.

S&T 05: Hello, Sci-Pi!
Sci-pi, standing for “science piction," is a term—analogous to sci-fi for science fiction—coined in the Game to mean expressions of science concepts by a variety of artistic modes. Sci-pi characters can be molecules, tools, methods, or organisms (including humans) featured on any Game Card. Students use words, illustrations, cartoons, comics, puppets, video, music, dance, or other expressive modes to tell their stories.

S&T 06: DNA Relay Story
This collaborative story-writing activity, in which each member of a team adds a section to the story, often produce hilarious sci-pi tales. Competitions consist of teams reading their stories, perhaps accompanied by hammy pantomime. More elaborately, stories can be staged as skits. Discussions following the presentations add to audience engagement and educational benefits. After the discussions, audiences vote to determine winners.

S&T 07: DNA Song & Dance
Students love to make music, and they relate to subjects presented via music, like Marc Furigay’s demonstrations on *Shark Tank*. Correspondingly, world-changing science stories, ripe for public intake via music and dance, eagerly await their turns to inspire potential grammy winners. These ingredients can be combined to breed agents of science literacy in your classrooms!

S&T 11: Issues Size Up—What Ifs… / S&T 12: Boost Fair-Mindedness
Consideration of (often controversial) issues surrounding uses of some DNA science discoveries is a crucial Game component, expressed in the activities suggested on these two S&T Cards. Grappling with the What Ifs (S&T 11) and arguing for positions you initially disfavor (S&T 12) makes impersonal issues personally relevant, hence more engaging.

S&T 09: WOW Charades / S&T 10: What Character Am I?
These Cards suggest fun-filled social games. The mini-game on S&T 09 requires players to familiarize themselves with the WOW Card Deck. The mini-game on S&T 10 prompts all players to examine the Cards used in order to accurately answer the What-Character-Am-I questions asked by the rotating “It” player.

S&T 14: DNA Scientist Fan Club / S&T 16: Spin-Offs for Young Kids / S&T 18: Spread DNA Savvy
These S&T Cards offer students opportunities to express their creative talents by communicating science content to others. They require students to tailor their presentations to audiences’ interests as they teach and

learn from those audiences. For S&T 14, the students' efforts are likely to make their featured scientist "stars" better able to communicate with the public, including teenagers and younger kids.

S&T 17: Seniors Special
The suggestions on this Card are apropos if you teach seniors in lifelong learning or other settings. Beyond that, the Card's pitch for initiating family powwows about inherited family traits sooner rather than later is important for school-aged students, because their families' older generations may not be available later.

S&T 20: One-A-Day DNA
This program is suited to anyone who wants to master the whole nine yards—well, actually two yards in the case of human DNA🤗! The target populations include students and teachers with an interest in the subject, scientists in other branches of science, health care professionals, all workers for whom such knowledge is highly relevant, and other interested members of the public.

WOW (Whoops-Or-Whoopee) Cards
WOW Cards portray the scientist subculture; viewers connect with anecdotes about the human side of science. The Deck is especially suitable for use by career counselors, students considering science careers, persons whose family member or friend is a scientist, and anyone curious about scientists' tribal customs. The Cards offer prompts for discussions about life as a scientist compared to life in other occupations and how students think they might handle the types of challenges confronted by scientists featured on the Cards.

iii (Issues/Insights/Innovations) Cards
The short iii Cards with their reports of exciting leading-edge discoveries—many accompanied by vivid humorous art—offer a user-friendly entry to the Game content. They can be very effective in student efforts to spread DNA savvy beyond the classroom—a much-needed outreach that you can promote.

Note that the tiny icons depicting Board Spaces in top right corner on fronts of many WOW & iii Cards link content on those Cards to specific Clusters of associated Claim Cards, where topics are elaborated.

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HERE'S TO YOU, TOP TEACHERS, AS YOU GO FORTH TO SPREAD THE DNA WORD! 👏🏻

A blog, where I hope you will comment, is planned for the www.DNAahead.com EDUCATORS PAGE, WHICH IS COMING SOON. ***Meanwhile, please share your ideas and experiences in using the Game materials by emailing them to DNAahead@comcast.net.***

Wishing You Best Teaching Ahead,

Dorothy Semenow

Your Faithful Fan, Dorothy Semenow, PhD
Creator of *DNA Ahead Game & More*™

PS. My team is creating a board game, ***CRISPR Whispers™,*** featuring CRISPR/Cas9, the revolutionary genome editing tool that can change genes—and hence characteristics—of our food, animals, medicines, and more. Its uses promise great benefits, but also bring serious concerns about potential harm.

Members of our Crowdsourcing Group for CRISPR Whispers™ offer ideas and feedback—or simply follow our progress and help spread the word about the Game. If you would like to do any or all of that, please email your name, town of residence, and any specific interests or skills to CRISPRahead@comcast.net, where you will be enthusiastically & most appreciatively welcomed.